REMARKS

Claims 1-38 stand rejected under 35 U.S.C. § 103 (a) as being obvious over US 5,716,558 to Nielson et al. (hereafter Nielson) and further in view of US 5,105,843 to Condron et al. (hereafter Condron). The foregoing rejection is traversed for the following reason:

As admitted and noted in the Office Action, Nielson discloses a solvent-borne composition containing at least one compressed fluid in an amount that renders a liquid mixture of the solvent-borne composition capable of forming a decompressive spray when sprayed though an orifice at a temperature and pressure into **an environment suitable for forming solid particulates by solvent evaporation**, which as noted in Nielson at column 11, lines 31-34 is a **gaseous environment**. Nielson at column 11, lines 35-38 further noted that the pressure of the gaseous environment, such as air, must be substantially lower than the spray pressure in order to obtain sufficient decompression of the compressive fluid to form the decompressive spray. Nielson noted at column 16, lines 29-34 that "A hot solution or slurry containing the solid component to be spray-dried **is typically ejected from an orifice in the form of a spray, and the liquid particle is made to dry during flight via evaporation. The droplet must be substantially rigid within a few seconds so as not to be deformed or destroyed upon impact.**" No such step or operation is contemplated in the claims of the present invention.

The invention in Nielson solves some of the problems with the aforedescribed thermal spray-drying process by introducing another component, namely a compressible fluid in an amount renders liquid mixture capable of forming a substantially decompressive spray. No such step or operation is contemplated in the claims of the present invention.

Nielson on column 16, line 67 and column 17, lines 1-12 notes that "Increasing the solids content of a solution are frequently not feasible, because the material is insufficiently soluble or the viscosity becomes too high to spray the material. Increases in the solids content of a slurry leads to more frequent clogging of piping and instrumentation, as well as to poorly dispersed product. While the material science aspects of the drying process are not sufficiently understood in all cases, it can nevertheless be observed that the

thermal evaporation process leads to non-uniform drying of the particle, as seen by skin formation (hollow shells), cracked particles, and differential precipitation of chemically different components within the particle." Thus, it is clear from the foregoing that clogging of piping and instrumentation, as well as to poorly dispersed product will be produced in the Nielson device, if the solids content of the solution is too high. NO such limit is contemplated in the current in invention. The "plug free" condition claimed in the present invention is not the same as that in Nielsen. As noted at page 5, lines 21-23 in the current application, "Plug free condition" means a flow condition through a pipe of polymer pellets in an aqueous medium wherein the pellets pass through a pipe having a substantially smooth bore and having substantially no obstructions or projections therein." Thus, one of ordinary skill in the art can readily note that even if one were to use the aforedescribed "plug free condition" in Nielson, the clogging can occur if the solids content is too high or the viscosity is too high. The reason for the plug free condition in the present invention is not related to its solids contents but it has to do with the heating of the pellets at high throughput rates (page 9 lines 8-10 of the current specification). The Office Action stated that Nielson acknowledges that the physical form of the particles is important and the physical property of the solids content leads to more frequent clogging of piping or instrumentation. The foregoing remark is respectfully questioned in view of the statement from Nielson cited above, since the only reference Nielson makes to clogging is when the solids content of the solution is too high. Thus, it is not seen why the plug free condition of the present invention is obvious in view of Nielson's teaching.

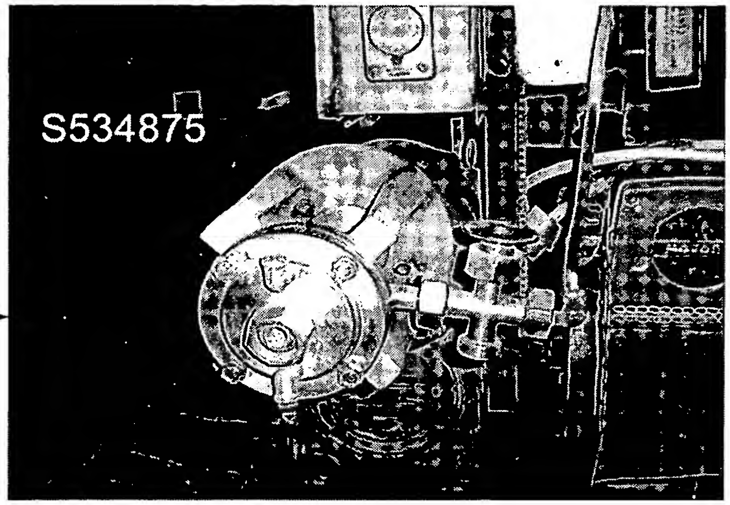
As admitted, in the Office Action, there is no teaching or suggestion in Nielson of heating a mixture of polymer pellets, an aqueous medium and at least one surfactant under "plug flow" conditions as currently claimed. It is not seen why the Office Action failed to take into account the requirement of "plug free" condition claimed in the present invention. The current specification on page 5, lines 24-32 states that "Plug flow condition" means a flow condition through a pipe of polymer pellets in an aqueous medium wherein each polymer pellet passing through the pipe **spends the same length of time in the pipe**. As a result, the residence time history of the pellets during a

heating step is substantially identical, thus substantially minimizing or eliminating variation in the degree of premature crosslinking of one thermosetting polymer pellet to the adjacent polymer pellet passing though the pipe. Similarly when a plug flow cooling condition is opted in cooling the aqueous medium containing polymer particles produced after shearing, the residence time history of the polymer particles during the cooling phase would be substantially identical. The current specifications on page 6, lines 4-5 that "One of the conditions for achieving a plug flow during the heating or cooling steps is to ensure that the flow is turbulent and not laminar." No such step is contemplated in Nielson, which sprays the liquid droplets into air. Moreover, as admitted in the Office Action, Condron teaches a laminar flow. See also Condron at column 17, lines 62-66 ("Accordingly, by **maintaining laminar flow** conditions by means of the present invention, the probability of large concentrations of non-solvent fluid in the form of **bubbles, plugs or slugs in undesirably reaching the outer perimeter of the injector and causing precipitation and solids build-up is minimized**."). Thus, not only Condron teaches away from the present invention, Nielson (See column 17, line 4-5) in the view of Condron also teaches away from the present invention since the plug flow condition, which requires "turbulent flow" is currently claimed. Thus, it is not seen why one of ordinary skill in the art would combine Neilson with Condron and even if combined, it would not lead to the claims of the present invention, as Nielson and Condron require a laminar flow condition to prevent clogging or precipitation of the solid component dissolved in the first fluid.

As noted earlier, the particles of Nielson are formed by passing a solution of solids further containing a decompressive component into an atmosphere, such as air, whereby the distance of flight through which the solution droplets navigate is very critical. No such element or step is claimed in the current invention, which claims shearing heated mixture. As noted on page 12, lines 4-7 of the specification, shearing of the heated particles is accomplished through shearing means 7 in Figure1A in the specification, such as a shearing device model No. 4MB1A supplied by E. T. Oakes Corporation. From the photographs attached below (Oakes mixer, model 4MB1A, s/n 210 with stainless contact parts, unit driven by 1 hp 3 phase, 230/460 volt us varidrive with speed range from 234 RPM to 2340 RPM), it can be readily

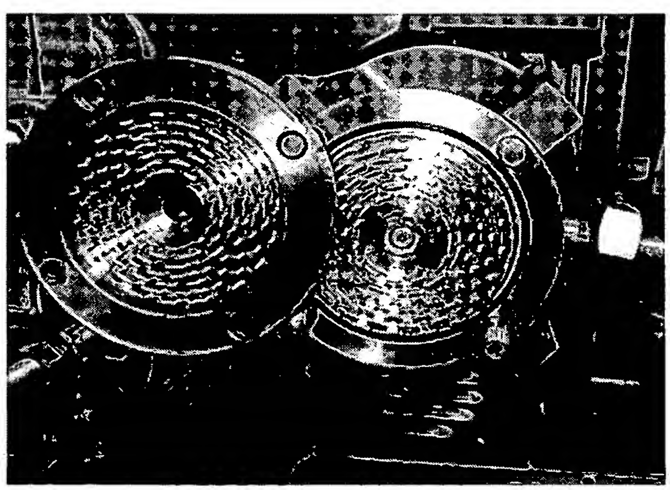
seen that the presently claimed shearing is patentably distinct from the spraying though an orifice claimed in Nielson:

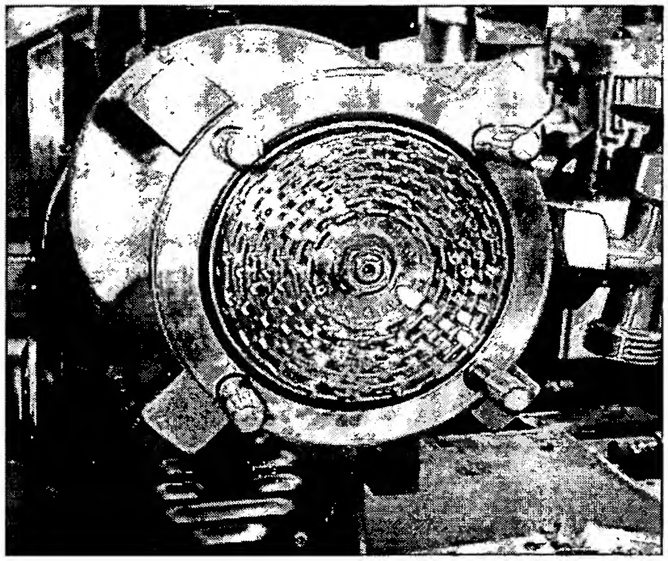
IN



OUT

From the foregoing photograph and Fig. 1A in the current specification, one can readily note that the sheared particles existing out of shearing means 7 enter into means 9 for cooling. Cooled particles produced after the shearing step, continue to be in the aqueous medium after their formation. By contrast, the particles of Nielson are formed by passing a solution of solids further containing a decompressive component **into an atmosphere**, such as air, whereby the distance of flight through which the solution droplets navigate is very critical, such as that by the time the droplets hit a surface, the solvent and decompressive components evaporate to form solid particles. The shearing discs shown below are patentably distinct from the spray orifice taught by Nielson:





From the foregoing, it is not seen why the shearing step claimed in the present invention is obvious over the spraying though an orifice in Nielson.

None of the features claimed in the device of claims 26-38 of the present invention is disclosed or suggested by Nielson or Condron taken individually and even when combined. Thus, it is not seen why the device of claims of the present invention are obvious over Nielson and Condron.

Should the Examiner wish to discuss any issues involved in this application, the Examiner is respectfully invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

SUDHIR G. DESHMUKH
ATTORNEY FOR APPLICANTS
REGISTRATION NO. 33,677
TELEPHONE: (302) 992-4385
FACSIMILE: (302) 992-5922

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